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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,547	01/03/2005	Yuya Hasegawa	P26498	9697

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/518,547	HASEGAWA ET AL.	
	Examiner	Art Unit	
	Burton S. Mullins	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13* is/are allowed.

6)☒ Claim(s) *1-3,12 and 14-18* is/are rejected.

7)☒ Claim(s) *19-23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Satomi et al. (JP 08-275484). Satomi teaches a linear-rotary composite actuator including: a casing 1; a stationary member (stator core) 10 which has a coil member (W) and is mounted in the casing (Fig.1); and a movable member which includes a moving element (rotor) 32 and is supported by the casing (by bearings 6/7); the moveable element 32 has a shaft 2 and is supported by the casing so as to be moved in an axial direction and in a rotational direction (abstract), wherein electric current flows through the coil member such that the moving element moves in the axial direction and in the rotational direction (abstract); wherein the stationary member includes a first stationary member for imparting to the movable member a force oriented in the axial direction (poles 11,12,15,16, 19, 20,23,24) and a second stationary member for imparting to the moveable member a force oriented in the rotational direction (poles 13,14,17,18,21,22,25,26); wherein the first stationary member includes a pair of first stationary elements provided symmetrically with respect to the rotational axis (poles 11,12,15,16,19,20,23,24 are bilaterally symmetric about the rotational axis; Fig.2) and the second stationary member includes a pair of second stationary elements provided symmetrically with respect to the rotational axis (poles 13,14,17,18,21,22, 25,26 are bilaterally symmetric about the rotational axis; Fig.2); and wherein the coil member includes a first coil (W1,W2,W5,W6,W9,W10,W13,W14) for exciting a first magnetic path passing through the stationary member and a second coil (W3,W4,W7,W8,W11,W12,W15,W16)

for exciting a second magnetic path passing through the second stationary member (gaps 40 separate the respective flux paths; Fig.6).

3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Cory (US 3,394,295). Cory teaches a linear-rotary actuator including: a casing 1/2/3/4; a stationary member (with poles 5/68/9) which has a coil member 5a/6a/8a/9a and is mounted in the casing (Figs.1&2); and a movable member which includes a moving element (rotor) and is supported by the casing (by bearings 15); the moveable element has a shaft 14 and is supported by the casing so as to be moved in an axial direction and in a rotational direction (c.1, lines 9-11), wherein electric current flows through the coil member such that the moving element moves in the axial direction and in the rotational direction (c.2, lines 16-19); wherein the stationary member includes a first stationary member for imparting to the movable member a force oriented in the axial direction (poles 5&6, c.2, lines 25-30; Fig.4) and a second stationary member for imparting to the moveable member a force oriented in the rotational direction (poles 8&9, c.2, lines 31-35; Fig.5); wherein the first stationary member includes a pair of first stationary elements provided symmetrically with respect to the rotational axis (poles 5&6 are bilaterally symmetric about the rotational axis; Fig.2) and the second stationary member includes a pair of second stationary elements provided symmetrically with respect to the rotational axis (poles 8&9 are bilaterally symmetric about the rotational axis; Fig.2); and wherein the coil member includes a first coil 5a/6a for exciting a first magnetic path passing through the stationary member and a second coil 8a/9a for exciting a second magnetic path passing through the second stationary member (Fig.2).

Regarding claims 2-3, the magnet 16 in Cory is magnetized orthogonally with respect to the axis and disposed symmetric with respect to the axis (Fig.2).

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 12 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable Nikaido (US 4,099,106) in view of Ichii et al. (JP 2002-199689). Nikaido teaches a compound motor including: a casing 35/36/37; a stationary member which has a coil member 14/20 & 26/32 and is mounted in the casing; and a movable member (armature) 1 which includes a moving element (corresponding rotary pole) 5 and is supported by the casing; the moveable element 1 has a shaft 2 and is supported by the casing so as to be moved in an axial direction and in a rotational direction (abstract), wherein electric current flows through the coil member 14/20 & 26/32 such that the moving element moves in the axial (linear) direction (coils 26&32, c.4, lines 34-60) and in the rotational direction (coils 14/20, c.4, lines 17-34); wherein the stationary member includes a first stationary member for imparting to the movable member a force oriented in the axial direction (poles 23/24/30/31) and a second stationary member for imparting to the moveable member a force oriented in the rotational direction (poles 11a-11f/12a-12f & 17a-17f/18a-18f); wherein the coil member includes a first coil 14/20 for exciting a first magnetic path passing through the stationary member and a second coil 26/32 for exciting a second magnetic path passing through the second stationary member (see respective flux lines in Fig.3).

Nikaido does not teach "an axial resonant spring that effects axial resonant motion of the moving element, which is provided between the moving element and the casing" (claim 12); or three springs oriented according to claim 14.

Ichii teaches a linear oscillator including axial resonant springs 91-93 between the moving element 11 and the casing 71 for the purpose of oscillating the plunger (abstract). The spring 91 is a first spring between the casing 71 and the moving element 11, spring 92 is between the moving element 11 and the further moving element 51, and spring 93 is between the further moving element 51 and the casing 71.

It would have been obvious to modify either Nikaido and provide axial resonant springs per Ichii to oscillate the moving element.

Regarding claims 15-16, in Nikaido respective first and second stationary members impart axial and rotational forces to the first and second portions of moveable members.

6. Claims 12 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chun (US Patent Publication 2001/0043016) in view of Ichii et al. (JP 2002-199689). Chun teaches a rotary-linear motor including: a casing 11 (Fig.3); a stationary member which has a coil member 12/14 and is mounted in the casing; and a movable member which includes a moving element 20 and is supported by the casing; the moveable element has a shaft 21 and is supported by the casing (inherent) so as to be moved in an axial direction and in a rotational direction (¶2), wherein electric current flows through the coil member 12/14 such that the moving element moves in the axial direction and in the rotational direction (¶25-¶33); wherein the stationary member includes a first stationary member (coils 12) for imparting to the movable member a force oriented in the axial direction and a second stationary member (coils 13) for imparting to the moveable member a force oriented in the rotational direction; wherein the coil member includes a first coil 12 for exciting a first magnetic path passing through the stationary member

and a second coil 13 for exciting a second magnetic path passing through the second stationary member (Fig.3).

Chun does not teach "an axial resonant spring that effects axial resonant motion of the moving element, which is provided between the moving element and the casing" (claim 12); or three springs oriented according to claim 14.

Regarding claims 15-16, in Chun respective first and second stationary members impart axial and rotational forces to the first and second portions of moveable members.

Regarding claims 17-18, in Chun the moving element 20 includes radially-oriented magnets (Fig.4b), with axially-symmetric magnets 23a, and the coils 12 and 14 of respective first and second stationary members are symmetric with respect to the axis of rotation (Fig.4a), the first coil member includes a pair of first coils 12 and the second coil member includes a pair of second coils 13 (Fig.4a), and the coils 12 and 14 are each excited in an "antiphase" manner because this is inherent to the three-phase U, V, W, U', V', W' windings used for the coils.

Response to Arguments

7. Applicant's arguments filed 23 June 2006 have been fully considered but they are not persuasive.

New grounds of rejection are applied to amended claims 1-3.

Regarding the rejection of claims 12 and 14-18 over Nikaido or Chun and Ichii, applicant argues that Nikaido and Chun are linear motors and Ichii is an oscillating motor and thus the latter is non-analogous art. This argument is not persuasive since it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably

pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Nikaido and Chun are in the field of both linear and reciprocating motors since in Nikaido motion in both axial directions is described (c.4, lines 34-c.5, line 6) and in Chun, the arrows in Fig.3 indicate motion in two directions along the axis, i.e. reciprocating motion. A reciprocating motor can be considered and oscillating motor since reciprocating motion is a form of oscillating motion. Thus, Nikaido, Chun and Ichii are within the same field of endeavor.

Allowable Subject Matter

8. Claim 13 is allowed. Applicant incorporates the indicated allowable subject matter of a rotational resonant spring between the moving element and the casing, for effecting resonant motion of the moving element in the rotational direction.

9. Claims 4-11 and 19-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 4, the prior art does not teach the claimed actuator including, inter alia, "wherein the first coil member includes a pair of first coils each provided in each of the first stationary elements and the second coil member includes a pair of second coils each provided in each of the second stationary elements; and wherein the first coils excite the first stationary elements in an antiphase excitation mode, respectively and the second coils excite the second stationary elements in an antiphase excitation mode, respectively."

Regarding claims 19 and 20, the prior art does not teach the claimed actuator including, inter alia, a "magnet member of the one of the moving element and the further moving element includes two magnets having opposite magnetization directions, respectively, with the one of the moving element and the further moving element undergoing the force oriented in the axial direction from the first stationary member; wherein each of the first stationary elements is formed by a substantially E-shaped magnetic part having three magnetic pole portions arranged in the axial direction.."

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
03 August 2006